

# SEQUENCE LISTING

<110> Meulenberg, Johanna J. M.  
 Bos-de Ruijter, Judy N. A.  
 Pol, Johannes M. A.

<120> INFECTIOUS CLONES OF RNA VIRUSES AND VACCINES AND DIAGNOSTIC  
 ASSAYS DERIVED THEREOF

<130> 2183-4041.4US

<150> 09/874,626  
 <151> 2001-06-05

<150> 09/297,535  
 <151> 1999-10-12

<150> PCT/NL97/00593  
 <151> 1997-10-29

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<170> PatentIn version 3.2

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Cys Arg Trp Tyr Pro Ile Val Gly Pro Val Pro Gly Val Ala Val His	
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Val Leu Thr Asn Leu Pro Leu Pro Gln Arg Pro Lys Pro Glu Asp Phe	
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Cys Pro Phe Glu Cys Ala Met Ala Asp Val Tyr Asp Ile Ser His Asp	
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Asp Trp Asn Val Val Leu Pro Gly Val Glu Thr Ala Asp Gln Thr Thr	
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Ala Cys Leu Arg Ile	Met Arg Glu Ala Cys	Asp Ala Ala Lys Leu	
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Ser Asp Pro Ala Thr	Gln Glu Trp Leu Ser	Arg Met Trp Asp Arg	
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Val Asp Met Leu Thr	Trp Arg Asn Thr Ser	Ala Tyr Gln Ala Phe	
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cgc acc tta gat ggc	agg ttt ggg ttt ctc	cca aag atg ata ctc	3476
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Ser His Leu Pro Val	Phe Phe Ser His Leu	Phe Lys Ser Asp Ser	
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Cys Ala Pro Lys Gly	Met Asp Pro Ile Phe	Leu Ala Thr Gly Trp	
1430	1435	1440	
cgt ggg tgc tgg acc	ggc cga agt ccc att	gag caa ccc tct gaa	4556
Arg Gly Cys Trp Thr	Gly Arg Ser Pro Ile	Glu Gln Pro Ser Glu	
1445	1450	1455	
aaa ccc atc gcg ttc	gcc cag ttg gat gaa	aag agg att acg gct	4601
Lys Pro Ile Ala Phe	Ala Gln Leu Asp Glu	Lys Arg Ile Thr Ala	
1460	1465	1470	

aga act gtg gtc gct	cag cct tat gat cct	aat caa gcc gta aag	4646
Arg Thr Val Val Ala	Gln Pro Tyr Asp Pro	Asn Gln Ala Val Lys	
1475	1480	1485	
tgc ttg cgg gtg tta	cag gcg ggt ggg gcg	atg gtg gcc gag gca	4691
Cys Leu Arg Val Leu	Gln Ala Gly Gly Ala	Met Val Ala Glu Ala	
1490	1495	1500	
gtc cca aaa gtg gtc	aaa gtt tct gct att	cca ttc cga gcc ccc	4736
Val Pro Lys Val Val	Lys Val Ser Ala Ile	Pro Phe Arg Ala Pro	
1505	1510	1515	
ttt ttt ccc acc gga	gtg aaa gtt gat ccc	gag tgc agg atc gtg	4781
Phe Phe Pro Thr Gly	Val Lys Val Asp Pro	Glu Cys Arg Ile Val	
1520	1525	1530	
gtc gac ccc gat act	ttt act aca gcc ctc	cgg tct ggt tac tct	4826
Val Asp Pro Asp Thr	Phe Thr Thr Ala Leu	Arg Ser Gly Tyr Ser	
1535	1540	1545	
acc aca aac ctc gtc	ctt ggt gtg ggg gac	ttt gcc cag ctg aat	4871
Thr Thr Asn Leu Val	Leu Gly Val Gly Asp	Phe Ala Gln Leu Asn	
1550	1555	1560	
gga cta aag atc agg	caa att tcc aag cct	tcg gga gga ggc cca	4916
Gly Leu Lys Ile Arg	Gln Ile Ser Lys Pro	Ser Gly Gly Gly Pro	
1565	1570	1575	
cac ctc att gct gcc	ctg cat gtt gcc tgc	tcg atg gcg ttg cac	4961
His Leu Ile Ala Ala	Leu His Val Ala Cys	Ser Met Ala Leu His	
1580	1585	1590	
atg ctt gct ggg gtt	tat gta act tca gtg	ggg tct tgc ggt gcc	5006
Met Leu Ala Gly Val	Tyr Val Thr Ser Val	Gly Ser Cys Gly Ala	
1595	1600	1605	
ggc acc aac gat cca	tgg tgc act aat ccg	ttt gcc gtt cct ggc	5051
Gly Thr Asn Asp Pro	Trp Cys Thr Asn Pro	Phe Ala Val Pro Gly	
1610	1615	1620	

tac gga cca ggc tct	ctc tgc acg tcc aga	ttg tgc atc tcc caa	5096
Tyr Gly Pro Gly Ser	Leu Cys Thr Ser Arg	Leu Cys Ile Ser Gln	
1625	1630	1635	
cat ggc ctt acc ctg	ccc ttg aca gca ctt	gtg gcg gga ttc ggt	5141
His Gly Leu Thr Leu	Pro Leu Thr Ala Leu	Val Ala Gly Phe Gly	
1640	1645	1650	
ctt cag gaa atc gcc	ttg gtc gtt ttg att	ttc gtt tcc atc gga	5186
Leu Gln Glu Ile Ala	Leu Val Val Leu Ile	Phe Val Ser Ile Gly	
1655	1660	1665	
ggc atg gct cat agg	ttg agt tgt aag gct	gat atg ctg tgc atc	5231
Gly Met Ala His Arg	Leu Ser Cys Lys Ala	Asp Met Leu Cys Ile	
1670	1675	1680	
tta ctt gca atc gcc	agc tat gtt tgg gta	ccc ctt acc tgg ttg	5276
Leu Leu Ala Ile Ala	Ser Tyr Val Trp Val	Pro Leu Thr Trp Leu	
1685	1690	1695	
ctt tgt gtg ttt cct	tgt tgg ttg cgc tgg	ttc tct ttg cac ccc	5321
Leu Cys Val Phe Pro	Cys Trp Leu Arg Trp	Phe Ser Leu His Pro	
1700	1705	1710	
ctc acc atc cta tgg	ttg gtg ttt ttc ttg	att tct gta aat atg	5366
Leu Thr Ile Leu Trp	Leu Val Phe Phe Leu	Ile Ser Val Asn Met	
1715	1720	1725	
cct tcg gga atc ttg	gcc gtg gtg tta ttg	gtt tct ctt tgg ctt	5411
Pro Ser Gly Ile Leu	Ala Val Val Leu Leu	Val Ser Leu Trp Leu	
1730	1735	1740	
ttg gga cgt tat act	aac att gct ggt ctt	gtc acc ccc tat gat	5456
Leu Gly Arg Tyr Thr	Asn Ile Ala Gly Leu	Val Thr Pro Tyr Asp	
1745	1750	1755	
att cat cat tac acc	agt ggc ccc cgc ggt	gtt gcc gcc tta gct	5501
Ile His His Tyr Thr	Ser Gly Pro Arg Gly	Val Ala Ala Leu Ala	
1760	1765	1770	

acc gca cca gat gga	acc tac ttg gct gcc	gtc cgc cgc gct gcg	5546
Thr Ala Pro Asp Gly	Thr Tyr Leu Ala Ala	Val Arg Arg Ala Ala	
1775	1780	1785	
ttg act ggt cgc acc	atg ctg ttc acc ccg	tct cag ctt ggg tcc	5591
Leu Thr Gly Arg Thr	Met Leu Phe Thr Pro	Ser Gln Leu Gly Ser	
1790	1795	1800	
ctt ctt gag ggc gct	ttc aga act cga aag	ccc tca ctg aac acc	5636
Leu Leu Glu Gly Ala	Phe Arg Thr Arg Lys	Pro Ser Leu Asn Thr	
1805	1810	1815	
gtc aat gtg gtt ggg	tcc tcc atg ggc tct	ggg gga gtg ttc acc	5681
Val Asn Val Val Gly	Ser Ser Met Gly Ser	Gly Gly Val Phe Thr	
1820	1825	1830	
atc gac ggg aaa att	agg tgc gtg act gcc	gca cat gtc ctt acg	5726
Ile Asp Gly Lys Ile	Arg Cys Val Thr Ala	Ala His Val Leu Thr	
1835	1840	1845	
ggg aat tcg gct agg	gtt tcc gga gtc ggc	ttc aat caa atg ctt	5771
Gly Asn Ser Ala Arg	Val Ser Gly Val Gly	Phe Asn Gln Met Leu	
1850	1855	1860	
gac ttt gat gtg aaa	ggg gac ttc gcc ata	gct gat tgc ccg aat	5816
Asp Phe Asp Val Lys	Gly Asp Phe Ala Ile	Ala Asp Cys Pro Asn	
1865	1870	1875	
tgg caa gga gct gct	ccc aag acc caa ttc	tgc gag gat gga tgg	5861
Trp Gln Gly Ala Ala	Pro Lys Thr Gln Phe	Cys Glu Asp Gly Trp	
1880	1885	1890	
gct ggc cgt gcc tat	tgg ctg aca tcc tct	ggc gtc gaa ccc ggt	5906
Ala Gly Arg Ala Tyr	Trp Leu Thr Ser Ser	Gly Val Glu Pro Gly	
1895	1900	1905	
gtt att ggg aat gga	ttc gcc ttc tgc ttc	acc gcg tgc ggc gat	5951
Val Ile Gly Asn Gly	Phe Ala Phe Cys Phe	Thr Ala Cys Gly Asp	
1910	1915	1920	

tcc ggg tcc cca gtg atc acc gaa gct ggt gag ctt gtc ggc gtt	5996
Ser Gly Ser Pro Val Ile Thr Glu Ala Gly Glu Leu Val Gly Val	
1925 1930 1935	
cac aca gga tca aat aaa caa gga ggt ggc atc gtc acg cgc cct	6041
His Thr Gly Ser Asn Lys Gln Gly Gly Gly Ile Val Thr Arg Pro	
1940 1945 1950	
tca ggc cag ttt tgt aac gtg gca ccc atc aag ctg agc gaa tta	6086
Ser Gly Gln Phe Cys Asn Val Ala Pro Ile Lys Leu Ser Glu Leu	
1955 1960 1965	
agt gaa ttc ttt gct gga ccc aag gtc ccg ctc ggt gat gtg aag	6131
Ser Glu Phe Phe Ala Gly Pro Lys Val Pro Leu Gly Asp Val Lys	
1970 1975 1980	
gtt ggc agc cac ata att aaa gat acg tgc gaa gta cct tca gat	6176
Val Gly Ser His Ile Ile Lys Asp Thr Cys Glu Val Pro Ser Asp	
1985 1990 1995	
ctt tgc gcc ttg ctt gct gcc aaa cct gaa ctg gag gga ggc ctc	6221
Leu Cys Ala Leu Leu Ala Ala Lys Pro Glu Leu Glu Gly Gly Leu	
2000 2005 2010	
tcc acc gtc caa ctt ctg tgt gtg ttt ttc cta ctg tgg aga atg	6266
Ser Thr Val Gln Leu Leu Cys Val Phe Phe Leu Leu Trp Arg Met	
2015 2020 2025	
atg gga cat gcc tgg acg ccc ttg gtt gct gtg ggg ttt ttc att	6311
Met Gly His Ala Trp Thr Pro Leu Val Ala Val Gly Phe Phe Ile	
2030 2035 2040	
ctg aat gag gtt ctc cca gct gtc ctg gtt cgg agt gtt ttc tcc	6356
Leu Asn Glu Val Leu Pro Ala Val Leu Val Arg Ser Val Phe Ser	
2045 2050 2055	
ttt ggg atg ttt gtg cta tct tgg ctc aca cca tgg tct gcg caa	6401
Phe Gly Met Phe Val Leu Ser Trp Leu Thr Pro Trp Ser Ala Gln	
2060 2065 2070	

gtt ctg atg atc agg	ctt cta aca gca gct	ctt aac agg aac aga	6446
Val Leu Met Ile Arg	Leu Leu Thr Ala Ala	Leu Asn Arg Asn Arg	
2075	2080	2085	
tgg tca ctt gcc ttt	tac agc ctt ggt gcg	gtg acc ggt ttt gtc	6491
Trp Ser Leu Ala Phe	Tyr Ser Leu Gly Ala	Val Thr Gly Phe Val	
2090	2095	2100	
gca gat ctt gcg gca	act caa ggg cac ccg	ttg cag gca gta atg	6536
Ala Asp Leu Ala Ala	Thr Gln Gly His Pro	Leu Gln Ala Val Met	
2105	2110	2115	
aat ttg agc acc tat	gcc ttc ctg cct cgg	atg atg gtt gtg acc	6581
Asn Leu Ser Thr Tyr	Ala Phe Leu Pro Arg	Met Met Val Val Thr	
2120	2125	2130	
tca cca gtc cca gtg	att gcg tgt ggt gtt	gtg cac cta ctt gcc	6626
Ser Pro Val Pro Val	Ile Ala Cys Gly Val	Val His Leu Leu Ala	
2135	2140	2145	
atc att ttg tac ttg	ttc aag tac cgc ggc	ctg cac aat gtt ctt	6671
Ile Ile Leu Tyr Leu	Phe Lys Tyr Arg Gly	Leu His Asn Val Leu	
2150	2155	2160	
gtt ggt gat gga gcg	ttt tct gca gct ttc	ttc ttg cga tac ttt	6716
Val Gly Asp Gly Ala	Phe Ser Ala Ala Phe	Phe Leu Arg Tyr Phe	
2165	2170	2175	
gcc gag gga aag ttg	agg gaa ggg gtg tcg	caa tcc tgc gga atg	6761
Ala Glu Gly Lys Leu	Arg Glu Gly Val Ser	Gln Ser Cys Gly Met	
2180	2185	2190	
aat cat gag tca tta	act ggt gcc ctc gct	atg aga ctc aat gac	6806
Asn His Glu Ser Leu	Thr Gly Ala Leu Ala	Met Arg Leu Asn Asp	
2195	2200	2205	
gag gac ttg gac ttc	ctt acg aaa tgg act	gat ttt aag tgc ttt	6851
Glu Asp Leu Asp Phe	Leu Thr Lys Trp Thr	Asp Phe Lys Cys Phe	
2210	2215	2220	

gtt tct gcg tcc aac	atg agg aat gca gca	ggc caa ttc atc gag	6896
Val Ser Ala Ser Asn	Met Arg Asn Ala Ala	Gly Gln Phe Ile Glu	
2225	2230	2235	
gct gcc tat gca aaa	gca ctt aga att gaa	ctt gcc cag ttg gtg	6941
Ala Ala Tyr Ala Lys	Ala Leu Arg Ile Glu	Leu Ala Gln Leu Val	
2240	2245	2250	
cag gtt gat aag gtt	cga ggt act ttg gcc	aag ctt gag gct ttt	6986
Gln Val Asp Lys Val	Arg Gly Thr Leu Ala	Lys Leu Glu Ala Phe	
2255	2260	2265	
gct gat acc gtg gca	ccc caa ctc tcg ccc	ggg gac att gtt gtt	7031
Ala Asp Thr Val Ala	Pro Gln Leu Ser Pro	Gly Asp Ile Val Val	
2270	2275	2280	
gct ctt ggc cat acg	cct gtt ggc agc atc	ttc gac cta aag gtt	7076
Ala Leu Gly His Thr	Pro Val Gly Ser Ile	Phe Asp Leu Lys Val	
2285	2290	2295	
ggg ggt acc aag cat	act ctc caa gtc att	gag acc aga gtc ctt	7121
Gly Gly Thr Lys His	Thr Leu Gln Val Ile	Glu Thr Arg Val Leu	
2300	2305	2310	
gcc ggg tcc aaa atg	acc gtg gcg cgc gtc	gtt gac cca acc ccc	7166
Ala Gly Ser Lys Met	Thr Val Ala Arg Val	Val Asp Pro Thr Pro	
2315	2320	2325	
acg ccc cca ccc gca	ccc gtg ccc atc ccc	ctc cca ccg aaa gtt	7211
Thr Pro Pro Pro Ala	Pro Val Pro Ile Pro	Leu Pro Pro Lys Val	
2330	2335	2340	
cta gag aat ggt ccc	aac gcc tgg ggg gat	ggg gac cgt ttg aat	7256
Leu Glu Asn Gly Pro	Asn Ala Trp Gly Asp	Gly Asp Arg Leu Asn	
2345	2350	2355	
aag aag aag agg cgt	agg atg gaa acc gtc	ggc atc ttt gtc atg	7301
Lys Lys Lys Arg Arg	Arg Met Glu Thr Val	Gly Ile Phe Val Met	
2360	2365	2370	



ggt ggg aag aag tac	cag aaa ttt tgg gac	aag aat tcc ggt gat	7346
Gly Gly Lys Lys Tyr	Gln Lys Phe Trp Asp	Lys Asn Ser Gly Asp	
2375	2380	2385	
gtg ttt tac gag gag	gtc cat gac aac aca	gat gcg tgg gag tgc	7391
Val Phe Tyr Glu Glu	Val His Asp Asn Thr	Asp Ala Trp Glu Cys	
2390	2395	2400	
ctc aga gtt ggt gac	cct gcc gac ttt gac	cct gag aag gga act	7436
Leu Arg Val Gly Asp	Pro Ala Asp Phe Asp	Pro Glu Lys Gly Thr	
2405	2410	2415	
ctg tgt ggg cat act	act att gaa gat aag	gat tac aaa gtc tac	7481
Leu Cys Gly His Thr	Thr Ile Glu Asp Lys	Asp Tyr Lys Val Tyr	
2420	2425	2430	
gcc tcc cca tct ggc	aag aag ttc ctg gtc	ccc gtc aac tca gag	7526
Ala Ser Pro Ser Gly	Lys Lys Phe Leu Val	Pro Val Asn Ser Glu	
2435	2440	2445	
agc gga aga gcc caa	tgg gaa gct gca aag	ctt tcc gtg gag cag	7571
Ser Gly Arg Ala Gln	Trp Glu Ala Ala Lys	Leu Ser Val Glu Gln	
2450	2455	2460	
gcc ctt ggc atg atg	aat gtc gac ggt gaa	ctg acg gcc aaa gaa	7616
Ala Leu Gly Met Met	Asn Val Asp Gly Glu	Leu Thr Ala Lys Glu	
2465	2470	2475	
gtg gag aaa ctg aaa	aga ata att gac aaa	ctt cag ggc ctg act	7661
Val Glu Lys Leu Lys	Arg Ile Ile Asp Lys	Leu Gln Gly Leu Thr	
2480	2485	2490	
aag gag cag tgt tta	aac tgc tag ccgccagcgg	cttgacccgc tgtggtcgcg	7715
Lys Glu Gln Cys Leu	Asn Cys		
2495			
gcggcttggt tggtactgag	acagcggtaa aaatagtcaa	atttcacaac cggactttca	7775
ccctagggcc tgtgaattta	aaagtggcca gtgaggttga	gctgaaagac gcggtcgagc	7835

acaaccaaca cccggttgca agaccggttg acggtggtgt tgtgctcctg cgttccgcag	7895
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 Met Lys Trp Gly Leu Tyr Lys Ala Ser Ser  
 2500 2505  
 aca aaa ttg gcc agc ttt ttg tgg atg ctt tca cgg aat ttt tgg 12131  
 Thr Lys Leu Ala Ser Phe Leu Trp Met Leu Ser Arg Asn Phe Trp  
 2510 2515 2520  
 tgt cca ttg ttg ata tca tca tat ttt tgg cca ttt tgt ttg gct 12176  
 Cys Pro Leu Leu Ile Ser Ser Tyr Phe Trp Pro Phe Cys Leu Ala  
 2525 2530 2535  
 tca cca tcg ccg gtt ggc tgg tgg tct ttt gca tca gat tgg ttt 12221  
 Ser Pro Ser Pro Val Gly Trp Trp Ser Phe Ala Ser Asp Trp Phe  
 2540 2545 2550  
 gct ccg cgg tat tcc gtg cgc gcc ctg cca ttc acc ctg agc aat 12266  
 Ala Pro Arg Tyr Ser Val Arg Ala Leu Pro Phe Thr Leu Ser Asn  
 2555 2560 2565

tac aga aga	tcc tat gag gcc ttt	ctt tct cag tgc cgg	gtg gac	12311
Tyr Arg Arg	Ser Tyr Glu Ala Phe	Leu Ser Gln Cys Arg	Val Asp	
2570	2575	2580		
att ccc acc	tgg ggg gta aaa cac	cct ttg ggg atg ttt	tgg cac	12356
Ile Pro Thr	Trp Gly Val Lys His	Pro Leu Gly Met Phe	Trp His	
2585	2590	2595		
cat aag gtg	tca acc ctg att gat	gaa atg gtg tcg cgt	cga atg	12401
His Lys Val	Ser Thr Leu Ile Asp	Glu Met Val Ser Arg	Arg Met	
2600	2605	2610		
tac cgc atc	atg gaa aaa gca ggg	caa gct gcc tgg aaa	cag gtg	12446
Tyr Arg Ile	Met Glu Lys Ala Gly	Gln Ala Ala Trp Lys	Gln Val	
2615	2620	2625		
gtg agc gag	gct acg ctg tct cgc	att agt agt ttg gat	gtg gtg	12491
Val Ser Glu	Ala Thr Leu Ser Arg	Ile Ser Ser Leu Asp	Val Val	
2630	2635	2640		
gct cat ttt	caa cat ctt gcc gcc	att gaa gcc gag acc	tgt aaa	12536
Ala His Phe	Gln His Leu Ala Ala	Ile Glu Ala Glu Thr	Cys Lys	
2645	2650	2655		
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Tyr Leu Ala	Ser Arg Leu Pro Met	Leu His Asn Leu Arg	Met Thr	
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Gly Ser Asn	Val Thr Ile Val Tyr	Asn Ser Thr Leu Asn	Gln Val	
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Phe Ala Ile	Phe Pro Thr Pro Gly	Ser Arg Pro Lys Leu	His Asp	
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Phe Gln Gln	Trp Leu Ile Ala Val	His Ser Ser Ile Phe	Ser Ser	
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ggt gca gct	tct tgt act ctt ttt	ggt gtg ctg tgg ttg	cgg gtt	12761		
Val Ala Ala	Ser Cys Thr Leu Phe	Val Val Leu Trp Leu	Arg Val			
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cca atg cta	cgt act gtt ttt ggt	ttc cgc tgg tta ggg	gca att	12806		
Pro Met Leu	Arg Thr Val Phe Gly	Phe Arg Trp Leu Gly	Ala Ile			
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Phe Leu Ser	Asn Ser Trp					
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acctaga atg gct	gcg tcc ctt ctt ttc	ctc ttg gtt ggt ttt	aaa	13263		
Met Ala	Ala Ser Leu Leu Phe	Leu Leu Val Gly Phe	Lys			
2755	2760	2765				
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Cys Phe Val Val	Ser Gln Ala Phe Ala	Cys Lys Pro Cys Phe	Ser			
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tcg agt ctt tca	gac atc aaa acc aac	act acc gca gca tca	ggc	13353		
Ser Ser Leu Ser	Asp Ile Lys Thr Asn	Thr Thr Ala Ala Ser	Gly			
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Phe Val Val Leu	Gln Asp Ile Ser Cys	Leu Arg His Gly Asp	Ser			
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Ser Phe Pro Thr Ile Arg Lys Ser Ser Gln Cys Arg Thr Ala Ile	
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Gly Thr Pro Val Tyr Ile Thr Ile Thr Ala Asn Val Thr Asp Glu	
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Asn Tyr Leu His Ser Ser Asp Leu Leu Met Leu Ser Ser Cys Leu	
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Phe Tyr Ala Ser Glu Met Ser Glu Lys Gly Phe Lys Val Val Phe	
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Gly Asn Val Ser Gly Ile Val Ala Val Cys Val Asn Phe Thr Ser	
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Tyr Val Gln His Val Lys Glu Phe Thr Gln Arg Ser Leu Val Val	
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Asp His Val Arg Leu Leu His Phe Met Thr Pro Glu Thr Met Arg	
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Trp Ala Thr Val Leu Ala Cys Leu Phe Ala Ile Leu Leu Ala Ile	
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Met Leu Gly Lys Cys Leu Thr Ala Gly Cys Cys Ser	
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Arg Leu Leu Ser Leu Trp Cys Ile Val Pro Phe Cys Phe Ala Val	
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Leu Gly	Ser Ala Asn Ser Ser	Ser Ser Ser His Phe	Gln Leu Ile	
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Tyr Asn	Leu Thr Leu Cys Glu	Leu Asn Gly Thr Asp	Trp Leu Ala	
2975	2980	2985		
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Glu Lys	Phe Asp Trp Ala Val	Glu Thr Phe Val Ile	Phe Pro Val	
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ttg act	cac att gtt tcc tat	ggg gca ctc acc acc	agc cat ttc	14032
Leu Thr	His Ile Val Ser Tyr	Gly Ala Leu Thr Thr	Ser His Phe	
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ctt gac	aca gtt ggt ctg gtt	act gtg tcc acc gcc	ggg ttt tat	14077
Leu Asp	Thr Val Gly Leu Val	Thr Val Ser Thr Ala	Gly Phe Tyr	
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cac ggg	cgg tat gtc ttg agt	agc atc tac gcg gtc	tgt gct ctg	14122
His Gly	Arg Tyr Val Leu Ser	Ser Ile Tyr Ala Val	Cys Ala Leu	
3035	3040	3045		
gct gcg	ttg att tgc ttc gtt	att agg ctt gcg aag	aac tgc atg	14167
Ala Ala	Leu Ile Cys Phe Val	Ile Arg Leu Ala Lys	Asn Cys Met	
3050	3055	3060		
tcc tgg	cgc tac tct tgt acc	aga tat acc aac ttc	ctt ctg gac	14212
Ser Trp	Arg Tyr Ser Cys Thr	Arg Tyr Thr Asn Phe	Leu Leu Asp	
3065	3070	3075		
act aag	ggc aga ctc tat cgt	tgg cgg tcg ccc gtt	atc ata gaa	14257
Thr Lys	Gly Arg Leu Tyr Arg	Trp Arg Ser Pro Val	Ile Ile Glu	
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Lys Gly	Gly Lys Val Glu Val	Glu Gly His Leu Ile	Asp Leu Lys	
3095	3100	3105		

aga gtt	gtg ctt	gat ggt	tcc	gtg gca	acc cct	tta	acc	aga gtt	14347
Arg Val	Val Leu	Asp Gly	Ser	Val Ala	Thr Pro	Leu	Thr	Arg Val	
3110			3115				3120		
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Ser Ala	Glu Gln	Trp Gly	Arg	Leu					
3125			3130						
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atg cca	aat aac	aac ggc	aag cag	caa	aag aaa	aag aag	ggg	aat	14917
Met Pro	Asn Asn	Asn Gly	Lys Gln	Gln	Lys Lys	Lys Lys	Lys Gly	Asn	
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ggc cag	cca gtc	aat cag	ctg tgc	cag	atg ctg	ggt aaa	atc	atc	14962
Gly Gln	Pro Val	Asn Gln	Leu Cys	Gln	Met Leu	Gly Lys	Ile	Ile	
	3150		3155				3160		
gcc cag	caa aac	cag tcc	aga ggc	aag	gga ccg	ggc aag	aaa	agt	15007
Ala Gln	Gln Asn	Gln Ser	Arg Gly	Lys	Gly Pro	Gly Lys	Lys	Ser	
	3165		3170				3175		
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Lys Lys	Lys Asn	Pro Glu	Lys Pro	His	Phe Pro	Leu Ala	Thr	Glu	
	3180		3185				3190		

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 Asp Asp Val Arg His His Phe Thr Pro Gly Glu Arg Gln Leu Cys  
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acc ctg tca gat tca ggg agg ata agt tac act gtg gag ttt agt 15187  
 Thr Leu Ser Asp Ser Gly Arg Ile Ser Tyr Thr Val Glu Phe Ser  
 3225 3230 3235

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 Leu Pro Thr His His Thr Val Arg Leu Ile Arg Val Thr Ala Ser  
 3240 3245 3250

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 Pro Ser Ala

agaatgtgtg gtggatggca ctgattgaca ttgtgcctct aagtcaccta ttcaattagg 15344

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<212> PRT

<213> Arterivirus porcine respiratory and reproductive syndrome virus

<400> 25

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Phe Met Ala Glu Gly Gln Val Tyr Cys Thr Arg Cys Leu Ser Ala Arg  
 20 25 30

Ser Leu Leu Pro Leu Asn Leu Gln Val Pro Glu Leu Gly Val Leu Gly  
35 40 45

Leu Phe Tyr Arg Pro Glu Glu Pro Leu Arg Trp Thr Leu Pro Arg Ala  
50 55 60

Phe Pro Thr Val Glu Cys Ser Pro Ala Gly Ala Cys Trp Leu Ser Ala  
65 70 75 80

Ile Phe Pro Ile Ala Arg Met Thr Ser Gly Asn Leu Asn Phe Gln Gln  
85 90 95

Arg Met Val Arg Val Ala Ala Glu Ile Tyr Arg Ala Gly Gln Leu Thr  
100 105 110

Pro Ala Val Leu Lys Ala Leu Gln Val Tyr Glu Arg Gly Cys Arg Trp  
115 120 125

Tyr Pro Ile Val Gly Pro Val Pro Gly Val Ala Val His Ala Asn Ser  
130 135 140

Leu His Val Ser Asp Lys Pro Phe Pro Gly Ala Thr His Val Leu Thr  
145 150 155 160

Asn Leu Pro Leu Pro Gln Arg Pro Lys Pro Glu Asp Phe Cys Pro Phe  
165 170 175

Glu Cys Ala Met Ala Asp Val Tyr Asp Ile Ser His Asp Ala Val Met  
180 185 190

Tyr Val Ala Arg Gly Lys Val Ser Trp Ala Pro Arg Gly Gly Asp Glu  
195 200 205

Val Lys Phe Glu Thr Val Pro Glu Glu Leu Lys Leu Ile Ala Asn Arg  
210 215 220

Leu His Ile Ser Phe Pro Pro His His Ala Val Asp Met Ser Glu Phe  
225 230 235 240

Ala Phe Ile Ala Pro Gly Ser Gly Val Ser Leu Arg Val Glu His Gln  
245 250 255

His Gly Cys Leu Pro Ala Asp Thr Val Pro Glu Gly Asn Cys Trp Trp  
260 265 270

Cys Leu Phe Asp Leu Leu Pro Pro Glu Val Gln Asn Lys Glu Ile Arg  
275 280 285

Arg Ala Asn Gln Phe Gly Tyr Gln Thr Lys His Gly Val Pro Gly Lys  
290 295 300

Tyr Leu Gln Arg Arg Leu Gln Val Asn Gly Leu Arg Ala Val Thr Asp  
305 310 315 320

Thr Asp Gly Pro Ile Val Val Gln Tyr Phe Ser Val Arg Glu Ser Trp  
325 330 335

Ile Arg His Phe Arg Leu Ala Glu Glu Pro Ser Leu Pro Gly Phe Glu  
340 345 350

Asp Leu Leu Arg Ile Arg Val Glu Pro Asn Thr Ser Pro Leu Gly Gly  
355 360 365

Lys Gly Glu Lys Ile Phe Arg Phe Gly Ser His Lys Trp Tyr Gly Ala  
370 375 380

Gly Lys Arg Ala Arg Arg Ala Arg Ser Gly Ala Thr Ala Thr Val Ala  
385 390 395 400

His Cys Ala Leu Pro Ala Arg Glu Ala Gln Gln Ala Lys Lys Leu Glu  
405 410 415

Val Ala Ser Ala Asn Arg Ala Glu His Leu Lys Tyr Tyr Ser Pro Pro  
420 425 430

Ala Asp Gly Asn Cys Gly Trp His Cys Ile Ser Ala Ile Thr Asn Arg  
435 440 445

Met Val Asn Ser Lys Phe Glu Thr Thr Leu Pro Glu Arg Val Arg Pro  
450 455 460

Ser Asp Asp Trp Ala Thr Asp Glu Asp Leu Val Asn Thr Ile Gln Ile  
465 470 475 480

Leu Arg Leu Pro Ala Ala Leu Asp Arg Asn Gly Ala Cys Ala Gly Ala  
485 490 495

Lys Tyr Val Leu Lys Leu Glu Gly Glu His Trp Thr Val Ser Val Thr  
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Pro Gly Met Thr Pro Ser Leu Leu Pro Leu Glu Cys Val Gln Gly Cys  
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Cys Glu His Lys Ser Gly Leu Gly Phe Pro Asp Val Val Glu Val Ser  
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Gly Phe Asp Pro Ala Cys Leu Asp Arg Leu Ala Glu Ile Met His Leu  
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Pro Ser Ser Val Ile Pro Ala Ala Leu Ala Glu Met Ser Asp Asp Phe  
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Asn Arg Leu Ala Ser Pro Ala Ala Thr Val Trp Thr Val Ser Gln Phe  
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Phe Ala Arg His Arg Gly Gly Glu His Pro Asp Gln Val Cys Leu Gly  
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Lys Ile Ile Asn Leu Cys Gln Val Ile Glu Glu Cys Cys Cys Ser Arg  
610 615 620

Asn Lys Ala Asn Arg Ala Thr Pro Glu Glu Val Ala Ala Lys Val Asp  
625 630 635 640

Gln Tyr Leu Arg Gly Ala Ala Ser Leu Gly Glu Cys Leu Ala Lys Leu  
645 650 655

Glu Arg Ala Arg Pro Pro Ser Ala Met Asp Thr Ser Phe Asp Trp Asn  
660 665 670

Val Val Leu Pro Gly Val Glu Thr Ala Asp Gln Thr Thr Lys Gln Leu  
675 680 685

His Val Asn Gln Cys Arg Ala Leu Val Pro Val Val Thr Gln Glu Pro  
690 695 700

Leu Asp Arg Asp Ser Val Pro Leu Thr Ala Phe Ser Leu Ser Asn Cys  
705 710 715 720

Tyr Tyr Pro Ala Gln Gly Asp Glu Val Arg His Arg Glu Arg Leu Asn  
725 730 735

Ser Val Leu Ser Lys Leu Glu Gly Val Val Arg Glu Glu Tyr Gly Leu  
740 745 750

Thr Pro Thr Gly Pro Gly Pro Arg Pro Ala Leu Pro Asn Gly Leu Asp  
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Glu Leu Lys Asp Gln Met Glu Glu Asp Leu Leu Lys Leu Val Asn Ala  
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Gln Ala Thr Ser Glu Met Met Ala Trp Ala Ala Glu Gln Val Asp Leu  
785 790 795 800

Lys Ala Trp Val Lys Asn Tyr Pro Arg Trp Thr Pro Pro Pro Pro Pro  
805 810 815

Pro Arg Val Gln Pro Arg Lys Thr Lys Ser Val Lys Ser Leu Leu Glu  
820 825 830



Asn Lys Pro Val Pro Ala Pro Arg Arg Lys Val Arg Ser Asp Tyr Gly  
835 840 845

Ser Pro Ile Leu Met Gly Asp Asn Val Pro Asn Gly Trp Glu Asp Ser  
850 855 860

Thr Val Gly Gly Pro Leu Asp Leu Ser Ala Pro Ser Glu Pro Met Thr  
865 870 875 880

Pro Leu Ser Glu Pro Val Leu Ile Ser Arg Pro Val Thr Ser Leu Ser  
885 890 895

Val Pro Ala Pro Val Pro Ala Pro Arg Arg Ala Val Ser Arg Pro Met  
900 905 910

Thr Pro Ser Ser Glu Pro Ile Phe Val Ser Ala Leu Arg His Lys Phe  
915 920 925

Gln Gln Val Glu Lys Ala Asn Leu Ala Ala Ala Ala Pro Met Tyr Gln  
930 935 940

Asp Glu Pro Leu Asp Leu Ser Ala Ser Ser Gln Thr Glu Tyr Gly Ala  
945 950 955 960

Ser Pro Leu Thr Pro Pro Gln Asn Val Gly Ile Leu Glu Val Arg Gly  
965 970 975

Gln Glu Ala Glu Glu Val Leu Ser Glu Ile Ser Asp Ile Leu Asn Asp  
980 985 990

Thr	Asn	Pro	Ala	Pro	Val	Ser	Ser	Ser	Ser	Ser	Leu	Ser	Ser	Val	Arg
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Ile	Thr	Arg	Pro	Lys	Tyr	Ser	Ala	Gln	Ala	Ile	Ile	Asp	Leu	Gly
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Gly	Pro	Cys	Ser	Gly	His	Leu	Gln	Arg	Glu	Lys	Glu	Ala	Cys	Leu
	1025					1030					1035			

Arg	Ile	Met	Arg	Glu	Ala	Cys	Asp	Ala	Ala	Lys	Leu	Ser	Asp	Pro
	1040					1045					1050			

Ala	Thr	Gln	Glu	Trp	Leu	Ser	Arg	Met	Trp	Asp	Arg	Val	Asp	Met
	1055					1060					1065			

Leu	Thr	Trp	Arg	Asn	Thr	Ser	Ala	Tyr	Gln	Ala	Phe	Arg	Thr	Leu
	1070					1075					1080			

Asp	Gly	Arg	Phe	Gly	Phe	Leu	Pro	Lys	Met	Ile	Leu	Glu	Thr	Pro
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Pro	Pro	Tyr	Pro	Cys	Gly	Phe	Val	Met	Leu	Pro	His	Thr	Pro	Ala
	1100					1105					1110			

Pro	Ser	Val	Ser	Ala	Glu	Ser	Asp	Leu	Thr	Ile	Gly	Ser	Val	Ala
	1115					1120					1125			

Thr	Glu	Asp	Ile	Pro	Arg	Ile	Leu	Gly	Lys	Ile	Glu	Asn	Thr	Gly
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Glu Met	Ile Asn Gln Gly Pro	Leu Ala Ser Ser Glu	Glu Glu Pro
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Val Tyr	Asn Gln Pro Ala Lys	Asp Ser Arg Ile Ser	Ser Arg Gly
1160	1165	1170	

Ser Asp	Glu Ser Thr Ala Ala	Pro Ser Ala Gly Thr	Gly Gly Ala
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Gly Leu	Phe Thr Asp Leu Pro	Pro Ser Asp Gly Val	Asp Ala Asp
1190	1195	1200	

Gly Gly	Gly Pro Leu Gln Thr	Val Arg Lys Lys Ala	Glu Arg Leu
1205	1210	1215	

Phe Asp	Gln Leu Ser Arg Gln	Val Phe Asn Leu Val	Ser His Leu
1220	1225	1230	

Pro Val	Phe Phe Ser His Leu	Phe Lys Ser Asp Ser	Gly Tyr Ser
1235	1240	1245	

Pro Gly	Asp Trp Gly Phe Ala	Ala Phe Thr Leu Phe	Cys Leu Phe
1250	1255	1260	

Leu Cys	Tyr Ser Tyr Pro Phe	Phe Gly Phe Val Pro	Leu Leu Gly
1265	1270	1275	

Val Phe	Ser Gly Ser Ser Arg	Arg Val Arg Met Gly	Val Phe Gly
1280	1285	1290	

Cys Trp	Leu Ala Phe Ala Val	Gly Leu Phe Lys Pro	Val Ser Asp
1295	1300	1305	

Pro Val	Gly Thr Ala Cys Glu	Phe Asp Ser Pro Glu	Cys Arg Asn
1310	1315	1320	

Val Leu	His Ser Phe Glu Leu	Leu Lys Pro Trp Asp	Pro Val Arg
1325	1330	1335	

Ser Leu	Val Val Gly Pro Val	Gly Leu Gly Leu Ala	Ile Leu Gly
1340	1345	1350	

Arg Leu	Leu Gly Gly Ala Arg	Tyr Ile Trp His Phe	Leu Leu Arg
1355	1360	1365	

Leu Gly	Ile Val Ala Asp Cys	Ile Leu Ala Gly Ala	Tyr Val Leu
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Ser Gln	Gly Arg Cys Lys Lys	Cys Trp Gly Ser Cys	Ile Arg Thr
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Ala Pro	Asn Glu Ile Ala Phe	Asn Val Phe Pro Phe	Thr Arg Ala
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Thr Arg	Ser Ser Leu Ile Asp	Leu Cys Asp Arg Phe	Cys Ala Pro
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Lys Gly	Met Asp Pro Ile Phe	Leu Ala Thr Gly Trp	Arg Gly Cys
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Trp	Thr	Gly	Arg	Ser	Pro	Ile	Glu	Gln	Pro	Ser	Glu	Lys	Pro	Ile
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Ala	Phe	Ala	Gln	Leu	Asp	Glu	Lys	Arg	Ile	Thr	Ala	Arg	Thr	Val
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Val	Ala	Gln	Pro	Tyr	Asp	Pro	Asn	Gln	Ala	Val	Lys	Cys	Leu	Arg
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Val	Leu	Gln	Ala	Gly	Gly	Ala	Met	Val	Ala	Glu	Ala	Val	Pro	Lys
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Val	Val	Lys	Val	Ser	Ala	Ile	Pro	Phe	Arg	Ala	Pro	Phe	Phe	Pro
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Thr	Gly	Val	Lys	Val	Asp	Pro	Glu	Cys	Arg	Ile	Val	Val	Asp	Pro
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Asp	Thr	Phe	Thr	Thr	Ala	Leu	Arg	Ser	Gly	Tyr	Ser	Thr	Thr	Asn
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Leu	Val	Leu	Gly	Val	Gly	Asp	Phe	Ala	Gln	Leu	Asn	Gly	Leu	Lys
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Ile	Arg	Gln	Ile	Ser	Lys	Pro	Ser	Gly	Gly	Gly	Pro	His	Leu	Ile
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Ala	Ala	Leu	His	Val	Ala	Cys	Ser	Met	Ala	Leu	His	Met	Leu	Ala
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Gly Val	Tyr Val Thr Ser Val	Gly Ser Cys Gly Ala	Gly Thr Asn
1595	1600	1605	

Asp Pro	Trp Cys Thr Asn Pro	Phe Ala Val Pro Gly	Tyr Gly Pro
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Gly Ser	Leu Cys Thr Ser Arg	Leu Cys Ile Ser Gln	His Gly Leu
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Thr Leu	Pro Leu Thr Ala Leu	Val Ala Gly Phe Gly	Leu Gln Glu
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Ile Ala	Leu Val Val Leu Ile	Phe Val Ser Ile Gly	Gly Met Ala
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His Arg	Leu Ser Cys Lys Ala	Asp Met Leu Cys Ile	Leu Leu Ala
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Ile Ala	Ser Tyr Val Trp Val	Pro Leu Thr Trp Leu	Leu Cys Val
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Phe Pro	Cys Trp Leu Arg Trp	Phe Ser Leu His Pro	Leu Thr Ile
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Leu Trp	Leu Val Phe Phe Leu	Ile Ser Val Asn Met	Pro Ser Gly
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Ile Leu	Ala Val Val Leu Leu	Val Ser Leu Trp Leu	Leu Gly Arg
1730	1735	1740	

Tyr	Thr	Asn	Ile	Ala	Gly	Leu	Val	Thr	Pro	Tyr	Asp	Ile	His	His
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Tyr	Thr	Ser	Gly	Pro	Arg	Gly	Val	Ala	Ala	Leu	Ala	Thr	Ala	Pro
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Asp	Gly	Thr	Tyr	Leu	Ala	Ala	Val	Arg	Arg	Ala	Ala	Leu	Thr	Gly
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Arg	Thr	Met	Leu	Phe	Thr	Pro	Ser	Gln	Leu	Gly	Ser	Leu	Leu	Glu
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Gly	Ala	Phe	Arg	Thr	Arg	Lys	Pro	Ser	Leu	Asn	Thr	Val	Asn	Val
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Val	Gly	Ser	Ser	Met	Gly	Ser	Gly	Gly	Val	Phe	Thr	Ile	Asp	Gly
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Lys	Ile	Arg	Cys	Val	Thr	Ala	Ala	His	Val	Leu	Thr	Gly	Asn	Ser
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Ala	Arg	Val	Ser	Gly	Val	Gly	Phe	Asn	Gln	Met	Leu	Asp	Phe	Asp
1850						1855					1860			

Val	Lys	Gly	Asp	Phe	Ala	Ile	Ala	Asp	Cys	Pro	Asn	Trp	Gln	Gly
1865						1870					1875			

Ala	Ala	Pro	Lys	Thr	Gln	Phe	Cys	Glu	Asp	Gly	Trp	Ala	Gly	Arg
1880						1885					1890			

Ala Tyr	Trp Leu Thr Ser Ser	Gly Val Glu Pro Gly	Val Ile Gly
1895	1900	1905	

Asn Gly	Phe Ala Phe Cys Phe	Thr Ala Cys Gly Asp	Ser Gly Ser
1910	1915	1920	

Pro Val	Ile Thr Glu Ala Gly	Glu Leu Val Gly Val	His Thr Gly
1925	1930	1935	

Ser Asn	Lys Gln Gly Gly Gly	Ile Val Thr Arg Pro	Ser Gly Gln
1940	1945	1950	

Phe Cys	Asn Val Ala Pro Ile	Lys Leu Ser Glu Leu	Ser Glu Phe
1955	1960	1965	

Phe Ala	Gly Pro Lys Val Pro	Leu Gly Asp Val Lys	Val Gly Ser
1970	1975	1980	

His Ile	Ile Lys Asp Thr Cys	Glu Val Pro Ser Asp	Leu Cys Ala
1985	1990	1995	

Leu Leu	Ala Ala Lys Pro Glu	Leu Glu Gly Gly Leu	Ser Thr Val
2000	2005	2010	

Gln Leu	Leu Cys Val Phe Phe	Leu Leu Trp Arg Met	Met Gly His
2015	2020	2025	

Ala Trp	Thr Pro Leu Val Ala	Val Gly Phe Phe Ile	Leu Asn Glu
2030	2035	2040	



Val Leu	Pro Ala	Val Leu	Val Arg	Ser Val	Phe Ser	Phe Gly	Met
2045			2050			2055	

Phe Val	Leu Ser	Trp Leu	Thr Pro	Trp Ser	Ala Gln	Val Leu	Met
2060			2065			2070	

Ile Arg	Leu Leu	Thr Ala	Ala Leu	Asn Arg	Asn Arg	Trp Ser	Leu
2075			2080			2085	

Ala Phe	Tyr Ser	Leu Gly	Ala Val	Thr Gly	Phe Val	Ala Asp	Leu
2090			2095			2100	

Ala Ala	Thr Gln	Gly His	Pro Leu	Gln Ala	Val Met	Asn Leu	Ser
2105			2110			2115	

Thr Tyr	Ala Phe	Leu Pro	Arg Met	Met Val	Val Thr	Ser Pro	Val
2120			2125			2130	

Pro Val	Ile Ala	Cys Gly	Val Val	His Leu	Leu Ala	Ile Ile	Leu
2135			2140			2145	

Tyr Leu	Phe Lys	Tyr Arg	Gly Leu	His Asn	Val Leu	Val Gly	Asp
2150			2155			2160	

Gly Ala	Phe Ser	Ala Ala	Phe Phe	Leu Arg	Tyr Phe	Ala Glu	Gly
2165			2170			2175	

Lys Leu	Arg Glu	Gly Val	Ser Gln	Ser Cys	Gly Met	Asn His	Glu
2180			2185			2190	

Ser	Leu	Thr	Gly	Ala	Leu	Ala	Met	Arg	Leu	Asn	Asp	Glu	Asp	Leu
2195						2200					2205			

Asp	Phe	Leu	Thr	Lys	Trp	Thr	Asp	Phe	Lys	Cys	Phe	Val	Ser	Ala
2210						2215					2220			

Ser	Asn	Met	Arg	Asn	Ala	Ala	Gly	Gln	Phe	Ile	Glu	Ala	Ala	Tyr
2225						2230					2235			

Ala	Lys	Ala	Leu	Arg	Ile	Glu	Leu	Ala	Gln	Leu	Val	Gln	Val	Asp
2240						2245					2250			

Lys	Val	Arg	Gly	Thr	Leu	Ala	Lys	Leu	Glu	Ala	Phe	Ala	Asp	Thr
2255						2260					2265			

Val	Ala	Pro	Gln	Leu	Ser	Pro	Gly	Asp	Ile	Val	Val	Ala	Leu	Gly
2270						2275					2280			

His	Thr	Pro	Val	Gly	Ser	Ile	Phe	Asp	Leu	Lys	Val	Gly	Gly	Thr
2285						2290					2295			

Lys	His	Thr	Leu	Gln	Val	Ile	Glu	Thr	Arg	Val	Leu	Ala	Gly	Ser
2300						2305					2310			

Lys	Met	Thr	Val	Ala	Arg	Val	Val	Asp	Pro	Thr	Pro	Thr	Pro	Pro
2315						2320					2325			

Pro	Ala	Pro	Val	Pro	Ile	Pro	Leu	Pro	Pro	Lys	Val	Leu	Glu	Asn
2330						2335					2340			

Gly Pro Asn Ala Trp Gly Asp	Gly Asp Arg Leu Asn	Lys Lys Lys
2345	2350	2355

Arg Arg Arg Met Glu Thr Val	Gly Ile Phe Val Met	Gly Gly Lys
2360	2365	2370

Lys Tyr Gln Lys Phe Trp Asp	Lys Asn Ser Gly Asp	Val Phe Tyr
2375	2380	2385

Glu Glu Val His Asp Asn Thr	Asp Ala Trp Glu Cys	Leu Arg Val
2390	2395	2400

Gly Asp Pro Ala Asp Phe Asp	Pro Glu Lys Gly Thr	Leu Cys Gly
2405	2410	2415

His Thr Thr Ile Glu Asp Lys	Asp Tyr Lys Val Tyr	Ala Ser Pro
2420	2425	2430

Ser Gly Lys Lys Phe Leu Val	Pro Val Asn Ser Glu	Ser Gly Arg
2435	2440	2445

Ala Gln Trp Glu Ala Ala Lys	Leu Ser Val Glu Gln	Ala Leu Gly
2450	2455	2460

Met Met Asn Val Asp Gly Glu	Leu Thr Ala Lys Glu	Val Glu Lys
2465	2470	2475

Leu Lys Arg Ile Ile Asp Lys	Leu Gln Gly Leu Thr	Lys Glu Gln
2480	2485	2490

Cys Leu Asn Cys  
2495

<210> 26

<211> 256

<212> PRT

<213> Arterivirus porcine respiratory and reproductive syndrome virus

<400> 26

Met Lys Trp Gly Leu Tyr Lys Ala Ser Ser Thr Lys Leu Ala Ser Phe  
1 5 10 15

Leu Trp Met Leu Ser Arg Asn Phe Trp Cys Pro Leu Leu Ile Ser Ser  
20 25 30

Tyr Phe Trp Pro Phe Cys Leu Ala Ser Pro Ser Pro Val Gly Trp Trp  
35 40 45

Ser Phe Ala Ser Asp Trp Phe Ala Pro Arg Tyr Ser Val Arg Ala Leu  
50 55 60

Pro Phe Thr Leu Ser Asn Tyr Arg Arg Ser Tyr Glu Ala Phe Leu Ser  
65 70 75 80

Gln Cys Arg Val Asp Ile Pro Thr Trp Gly Val Lys His Pro Leu Gly  
85 90 95

Met Phe Trp His His Lys Val Ser Thr Leu Ile Asp Glu Met Val Ser  
100 105 110

Arg Arg Met Tyr Arg Ile Met Glu Lys Ala Gly Gln Ala Ala Trp Lys  
115 120 125

Gln Val Val Ser Glu Ala Thr Leu Ser Arg Ile Ser Ser Leu Asp Val  
130 135 140

Val Ala His Phe Gln His Leu Ala Ala Ile Glu Ala Glu Thr Cys Lys  
145 150 155 160

Tyr Leu Ala Ser Arg Leu Pro Met Leu His Asn Leu Arg Met Thr Gly  
165 170 175

Ser Asn Val Thr Ile Val Tyr Asn Ser Thr Leu Asn Gln Val Phe Ala  
180 185 190

Ile Phe Pro Thr Pro Gly Ser Arg Pro Lys Leu His Asp Phe Gln Gln  
195 200 205

Trp Leu Ile Ala Val His Ser Ser Ile Phe Ser Ser Val Ala Ala Ser  
210 215 220

Cys Thr Leu Phe Val Val Leu Trp Leu Arg Val Pro Met Leu Arg Thr  
225 230 235 240

Val Phe Gly Phe Arg Trp Leu Gly Ala Ile Phe Leu Ser Asn Ser Trp  
245 250 255

<210> 27  
<211> 178  
<212> PRT

<213> Arterivirus porcine respiratory and reproductive syndrome virus

<400> 27

Met Ala Ala Ser Leu Leu Phe Leu Leu Val Gly Phe Lys Cys Phe Val  
1 5 10 15

Val Ser Gln Ala Phe Ala Cys Lys Pro Cys Phe Ser Ser Ser Leu Ser  
20 25 30

Asp Ile Lys Thr Asn Thr Thr Ala Ala Ser Gly Phe Val Val Leu Gln  
35 40 45

Asp Ile Ser Cys Leu Arg His Gly Asp Ser Ser Phe Pro Thr Ile Arg  
50 55 60

Lys Ser Ser Gln Cys Arg Thr Ala Ile Gly Thr Pro Val Tyr Ile Thr  
65 70 75 80

Ile Thr Ala Asn Val Thr Asp Glu Asn Tyr Leu His Ser Ser Asp Leu  
85 90 95

Leu Met Leu Ser Ser Cys Leu Phe Tyr Ala Ser Glu Met Ser Glu Lys  
100 105 110

Gly Phe Lys Val Val Phe Gly Asn Val Ser Gly Ile Val Ala Val Cys  
115 120 125

Val Asn Phe Thr Ser Tyr Val Gln His Val Lys Glu Phe Thr Gln Arg  
130 135 140



85

90

95

Ser Thr Ala Gly Phe Tyr His Gly Arg Tyr Val Leu Ser Ser Ile Tyr  
 100 105 110

Ala Val Cys Ala Leu Ala Ala Leu Ile Cys Phe Val Ile Arg Leu Ala  
 115 120 125

Lys Asn Cys Met Ser Trp Arg Tyr Ser Cys Thr Arg Tyr Thr Asn Phe  
 130 135 140

Leu Leu Asp Thr Lys Gly Arg Leu Tyr Arg Trp Arg Ser Pro Val Ile  
 145 150 155 160

Ile Glu Lys Gly Gly Lys Val Glu Val Glu Gly His Leu Ile Asp Leu  
 165 170 175

Lys Arg Val Val Leu Asp Gly Ser Val Ala Thr Pro Leu Thr Arg Val  
 180 185 190

Ser Ala Glu Gln Trp Gly Arg Leu  
 195 200

<210> 29

<211> 123

<212> PRT

<213> Arterivirus porcine respiratory and reproductive syndrome virus

<400> 29

Met Pro Asn Asn Asn Gly Lys Gln Gln Lys Lys Lys Gly Asn Gly  
 1 5 10 15



Gln Pro Val Asn Gln Leu Cys Gln Met Leu Gly Lys Ile Ile Ala Gln  
 20 25 30

Gln Asn Gln Ser Arg Gly Lys Gly Pro Gly Lys Lys Ser Lys Lys Lys  
 35 40 45

Asn Pro Glu Lys Pro His Phe Pro Leu Ala Thr Glu Asp Asp Val Arg  
 50 55 60

His His Phe Thr Pro Gly Glu Arg Gln Leu Cys Leu Ser Ser Ile Gln  
 65 70 75 80

Thr Ala Phe Asn Gln Gly Ala Gly Thr Cys Thr Leu Ser Asp Ser Gly  
 85 90 95

Arg Ile Ser Tyr Thr Val Glu Phe Ser Leu Pro Thr His His Thr Val  
 100 105 110

Arg Leu Ile Arg Val Thr Ala Ser Pro Ser Ala  
 115 120

<210> 30

<211> 1463

<212> PRT

<213> Arterivirus porcine respiratory and reproductive syndrome virus

<220>

<221> MISC\_FEATURE

<222> (1)..(1457)

<223> ORF 1b, nucleotides 7682 to 12055 of the viral sequence

<220>

<221> MISC\_FEATURE

<222> (1)..(1457)

<223> ORF 1b, nucleotides 7664 to 12055 of the viral sequence

<400> 30

Gly Ala Val Phe Lys Leu Leu Ala Ala Ser Gly Leu Thr Arg Cys Gly  
1 5 10 15

Arg Gly Gly Leu Val Val Thr Glu Thr Ala Val Lys Ile Val Lys Phe  
20 25 30

His Asn Arg Thr Phe Thr Leu Gly Pro Val Asn Leu Lys Val Ala Ser  
35 40 45

Glu Val Glu Leu Lys Asp Ala Val Glu His Asn Gln His Pro Val Ala  
50 55 60

Arg Pro Val Asp Gly Gly Val Val Leu Leu Arg Ser Ala Val Pro Ser  
65 70 75 80

Leu Ile Asp Val Leu Ile Ser Gly Ala Asp Ala Ser Pro Lys Leu Leu  
85 90 95

Ala Arg His Gly Pro Gly Asn Thr Gly Ile Asp Gly Thr Leu Trp Asp  
100 105 110

Phe Glu Ala Glu Ala Thr Lys Glu Glu Ile Ala Leu Ser Ala Gln Ile  
115 120 125

Ile Gln Ala Cys Asp Ile Arg Arg Gly Asp Ala Pro Glu Ile Gly Leu  
130 135 140

Pro Tyr Lys Leu Tyr Pro Val Arg Gly Asn Pro Glu Arg Val Lys Gly  
145 150 155 160

Val Leu Gln Asn Thr Arg Phe Gly Asp Ile Pro Tyr Lys Thr Pro Ser  
165 170 175

Asp Thr Gly Ser Pro Val His Ala Ala Ala Cys Leu Thr Pro Asn Ala  
180 185 190

Thr Pro Val Thr Asp Gly Arg Ser Val Leu Ala Thr Thr Met Pro Ser  
195 200 205

Gly Phe Glu Leu Tyr Val Pro Thr Ile Pro Ala Ser Val Leu Asp Tyr  
210 215 220

Leu Asp Ser Arg Pro Asp Cys Pro Lys Gln Leu Thr Glu His Gly Cys  
225 230 235 240

Glu Asp Ala Ala Leu Arg Asp Leu Ser Lys Tyr Asp Leu Ser Thr Gln  
245 250 255

Gly Phe Val Leu Pro Gly Val Leu Arg Leu Val Arg Lys Tyr Leu Phe  
260 265 270

Ala His Val Gly Lys Cys Pro Pro Val His Arg Pro Ser Thr Tyr Pro  
275 280 285

Ala Lys Asn Ser Met Ala Gly Ile Asn Gly Asn Arg Phe Pro Thr Lys  
290 295 300

Asp Ile Gln Ser Val Pro Glu Ile Asp Val Leu Cys Ala Gln Ala Val  
305 310 315 320

Arg Glu Asn Trp Gln Thr Val Thr Pro Cys Thr Leu Lys Lys Gln Tyr  
325 330 335

Cys Gly Lys Lys Lys Thr Arg Thr Ile Leu Gly Thr Asn Asn Phe Ile  
340 345 350

Ala Leu Ala His Arg Ala Ala Leu Ser Gly Val Thr Gln Gly Phe Met  
355 360 365

Lys Lys Ala Phe Asn Ser Pro Ile Ala Leu Gly Lys Asn Lys Phe Lys  
370 375 380

Glu Leu Gln Thr Pro Val Leu Gly Arg Cys Leu Glu Ala Asp Leu Ala  
385 390 395 400

Ser Cys Asp Arg Ser Thr Pro Ala Ile Val Arg Trp Phe Ala Ala Asn  
405 410 415

Leu Leu Tyr Glu Leu Ala Cys Ala Glu Glu His Leu Pro Ser Tyr Val  
420 425 430

Leu Asn Cys Cys His Asp Leu Leu Val Thr Gln Ser Gly Ala Val Thr  
435 440 445

Lys Arg Gly Gly Leu Ser Ser Gly Asp Pro Ile Thr Ser Val Ser Asn  
450 455 460

Thr Ile Tyr Ser Leu Val Ile Tyr Ala Gln His Met Val Leu Ser Tyr  
465 470 475 480

Phe Lys Ser Gly His Pro His Gly Leu Leu Phe Leu Gln Asp Gln Leu  
485 490 495

Lys Phe Glu Asp Met Leu Lys Val Gln Pro Leu Ile Val Tyr Ser Asp  
500 505 510

Asp Leu Val Leu Tyr Ala Glu Ser Pro Thr Met Pro Asn Tyr His Trp  
515 520 525

Trp Val Glu His Leu Asn Leu Met Leu Gly Phe Gln Thr Asp Pro Lys  
530 535 540

Lys Thr Ala Ile Thr Asp Ser Pro Ser Phe Leu Gly Cys Arg Ile Ile  
545 550 555 560

Asn Gly Arg Gln Leu Val Pro Asn Arg Asp Arg Ile Leu Ala Ala Leu  
565 570 575

Ala Tyr His Met Lys Ala Ser Asn Val Ser Glu Tyr Tyr Ala Ala Ala  
580 585 590

Ala Ala Ile Leu Met Asp Ser Cys Ala Cys Leu Glu Tyr Asp Pro Glu  
595 600 605

Trp Phe Glu Glu Leu Val Val Gly Ile Ala Gln Cys Ala Arg Lys Asp  
610 615 620

Gly Tyr Ser Phe Pro Gly Pro Pro Phe Phe Leu Ser Met Trp Glu Lys  
625 630 635 640

Leu Arg Ser Asn His Glu Gly Lys Lys Ser Arg Met Cys Gly Tyr Cys  
645 650 655

Gly Ala Pro Ala Pro Tyr Ala Thr Ala Cys Gly Leu Asp Val Cys Ile  
660 665 670

Tyr His Thr His Phe His Gln His Cys Pro Val Ile Ile Trp Cys Gly  
675 680 685

His Pro Ala Gly Ser Gly Ser Cys Ser Glu Cys Lys Pro Pro Leu Gly  
690 695 700

Lys Gly Thr Ser Pro Leu Asp Glu Val Leu Glu Gln Val Pro Tyr Lys  
705 710 715 720

Pro Pro Arg Thr Val Ile Met His Val Glu Gln Gly Leu Thr Pro Leu  
725 730 735

Asp Pro Gly Arg Tyr Gln Thr Arg Arg Gly Leu Val Ser Val Arg Arg  
740 745 750

Gly Ile Arg Gly Asn Glu Val Asp Leu Pro Asp Gly Asp Tyr Ala Ser  
755 760 765

Thr Ala Leu Leu Pro Thr Cys Lys Glu Ile Asn Met Val Ala Val Ala  
770 775 780

Ser Asn Val Leu Arg Ser Arg Phe Ile Ile Gly Pro Pro Gly Ala Gly  
785 790 795 800

Lys Thr Tyr Trp Leu Leu Gln Gln Val Gln Asp Gly Asp Val Ile Tyr  
805 810 815

Thr Pro Thr His Gln Thr Met Leu Asp Met Ile Arg Ala Leu Gly Thr  
820 825 830

Cys Arg Phe Asn Val Pro Ala Gly Thr Thr Leu Gln Phe Pro Ala Pro  
835 840 845

Ser Arg Thr Gly Pro Trp Val Arg Ile Leu Ala Gly Gly Trp Cys Pro  
850 855 860

Gly Lys Asn Ser Phe Leu Asp Glu Ala Ala Tyr Cys Asn His Leu Asp  
865 870 875 880

Val Leu Arg Leu Leu Ser Lys Thr Thr Leu Thr Cys Leu Gly Asp Phe  
885 890 895

Lys Gln Leu His Pro Val Gly Phe Asp Ser His Cys Tyr Val Phe Asp  
900 905 910

Ile Met Pro Gln Thr Gln Leu Lys Thr Ile Trp Arg Phe Gly Gln Asn  
915 920 925

Ile Cys Asp Ala Ile Gln Pro Asp Tyr Arg Asp Lys Leu Val Ser Met			
930	935	940	
Val Asn Thr Thr Arg Val Thr Tyr Met Glu Lys Pro Val Lys Tyr Gly			
945	950	955	960
Gln Val Leu Thr Pro Tyr His Arg Asp Arg Glu Asp Gly Ala Ile Thr			
	965	970	975
Ile Asp Ser Ser Gln Gly Ala Thr Phe Asp Val Val Thr Leu His Leu			
	980	985	990
Pro Thr Lys Asp Ser Leu Asn Arg Gln Arg Ala Leu Val Ala Ile Thr			
	995	1000	1005
Arg Ala Arg His Ala Ile Phe Val Tyr Asp Pro His Arg Gln Leu			
1010	1015	1020	
Gln Ser Met Phe Asp Leu Pro Ala Lys Gly Thr Pro Val Asn Leu			
1025	1030	1035	
Ala Val His Arg Asp Glu Gln Leu Ile Val Leu Asp Arg Asn Asn			
1040	1045	1050	
Lys Glu Cys Thr Val Ala Gln Ala Ile Gly Asn Gly Asp Lys Phe			
1055	1060	1065	
Arg Ala Thr Asp Lys Arg Val Val Asp Ser Leu Arg Ala Ile Cys			
1070	1075	1080	



Ala Asp	Leu Glu Gly Ser Ser	Ser Pro Leu Pro Lys	Val Ala His
1085	1090	1095	

Asn Leu	Gly Phe Tyr Phe Ser	Pro Asp Leu Thr Gln	Phe Ala Lys
1100	1105	1110	

Leu Pro	Val Asp Leu Ala Pro	His Trp Pro Val Val	Thr Thr Gln
1115	1120	1125	

Asn Asn	Glu Lys Trp Pro Asp	Arg Leu Val Ala Ser	Leu Arg Pro
1130	1135	1140	

Val His	Lys Tyr Ser Arg Ala	Cys Ile Gly Ala Gly	Tyr Met Val
1145	1150	1155	

Gly Pro	Ser Val Phe Leu Gly	Thr Pro Gly Val Val	Ser Tyr Tyr
1160	1165	1170	

Leu Thr	Lys Phe Val Lys Gly	Glu Ala Gln Val Leu	Pro Glu Thr
1175	1180	1185	

Val Phe	Ser Thr Gly Arg Ile	Glu Val Asp Cys Arg	Glu Tyr Leu
1190	1195	1200	

Asp Asp	Arg Glu Arg Glu Val	Ala Glu Ser Leu Pro	His Ala Phe
1205	1210	1215	

Ile Gly	Asp Val Lys Gly Thr	Thr Val Gly Gly Cys	His His Val
1220	1225	1230	

Thr Ser Lys Tyr Leu Pro Arg Phe Leu Pro Lys Glu Ser Val Ala  
 1235 1240 1245

Val Val Gly Val Ser Ser Pro Gly Lys Ala Ala Lys Ala Val Cys  
 1250 1255 1260

Thr Leu Thr Asp Val Tyr Leu Pro Asp Leu Glu Ala Tyr Leu His  
 1265 1270 1275

Pro Glu Thr Gln Ser Lys Cys Trp Lys Val Met Leu Asp Phe Lys  
 1280 1285 1290

Glu Val Arg Leu Met Val Trp Lys Asp Lys Thr Ala Tyr Phe Gln  
 1295 1300 1305

Leu Glu Gly Arg Tyr Phe Thr Trp Tyr Gln Leu Ala Ser Tyr Ala  
 1310 1315 1320

Ser Tyr Ile Arg Val Pro Val Asn Ser Thr Val Tyr Leu Asp Pro  
 1325 1330 1335

Cys Met Gly Pro Ala Leu Cys Asn Arg Arg Val Val Gly Ser Thr  
 1340 1345 1350

His Trp Gly Ala Asp Leu Ala Val Thr Pro Tyr Asp Tyr Gly Ala  
 1355 1360 1365

Lys Ile Ile Leu Ser Ser Ala Tyr His Gly Glu Met Pro Pro Gly  
 1370 1375 1380

Tyr Lys Ile Leu Ala Cys Ala Glu Phe Ser Leu Asp Asp Pro Val  
 1385 1390 1395

Lys Tyr Lys His Thr Trp Gly Phe Glu Ser Asp Thr Ala Tyr Leu  
 1400 1405 1410

Tyr Glu Phe Thr Gly Asn Gly Glu Asp Trp Glu Asp Tyr Asn Asp  
 1415 1420 1425

Ala Phe Arg Ala Arg Gln Lys Gly Lys Ile Tyr Lys Ala Thr Ala  
 1430 1435 1440

Thr Ser Met Lys Phe Tyr Phe Pro Pro Gly Pro Val Ile Glu Pro  
 1445 1450 1455

Thr Leu Gly Leu Asn  
 1460

<210> 31

<211> 254

<212> PRT

<213> Arterivirus porcine respiratory and reproductive syndrome virus

<220>

<221> MISC\_FEATURE

<222> (1)..(254)

<223> GP3 (ORF 3), nucleotides 12680 to 13444 of the viral sequence

<400> 31

Met Ala Asn Ser Cys Thr Phe Leu His Ile Phe Leu Cys Cys Ser Phe  
 1 5 10 15

Leu Tyr Ser Phe Cys Cys Ala Val Val Ala Gly Ser Asn Ala Thr Tyr  
20 25 30

Cys Phe Trp Phe Pro Leu Val Arg Gly Asn Phe Ser Phe Glu Leu Met  
35 40 45

Val Asn Tyr Thr Val Cys Pro Pro Cys Leu Thr Arg Gln Ala Ala Ala  
50 55 60

Glu Val Leu Glu Pro Gly Arg Ser Leu Trp Cys Arg Ile Gly His Asp  
65 70 75 80

Arg Cys Gly Glu Asp Asp His Asp Glu Leu Gly Phe Met Val Pro Pro  
85 90 95

Gly Leu Ser Ser Glu Ser His Leu Thr Ser Val Tyr Ala Trp Leu Ala  
100 105 110

Phe Leu Ser Phe Ser Tyr Thr Ala Gln Phe His Pro Glu Ile Phe Gly  
115 120 125

Ile Gly Asn Val Ser Glu Val Tyr Val Asp Ile Lys His Gln Phe Ile  
130 135 140

Cys Ala Val His Asp Gly Gln Asn Thr Thr Leu Pro Arg His Asp Asn  
145 150 155 160

Ile Ser Ala Val Phe Gln Thr Tyr Tyr Gln His Gln Val Asp Gly Gly  
165 170 175

Asn Trp Phe His Leu Glu Trp Leu Arg Pro Phe Phe Ser Ser Trp Leu  
 180 185 190

Val Leu Asn Val Ser Trp Phe Leu Arg Arg Ser Pro Ala Ser His Val  
 195 200 205

Ser Val Arg Val Phe Gln Thr Ser Lys Pro Thr Leu Pro Gln His Gln  
 210 215 220

Ala Leu Leu Ser Ser Arg Thr Ser Ala Ala Leu Gly Met Ala Thr Arg  
 225 230 235 240

Pro Phe Arg Arg Phe Ala Lys Ala Leu Asn Ala Ala Arg Arg  
 245 250

<210> 32

<211> 174

<212> PRT

<213> Arterivirus porcine respiratory and reproductive syndrome virus

<220>

<221> MISC\_FEATURE

<222> (1)..(174)

<223> Protein M (ORF 6), nucleotides 14359 to 14883 of the viral  
 sequence

<400> 32

Met Gly Ser Ser Leu Asp Asp Phe Cys His Asp Ser Thr Ala Pro Gln  
 1 5 10 15

Lys Val Leu Leu Ala Phe Ser Ile Thr Tyr Thr Pro Val Met Ile Tyr

20

25

30

Ala Leu Lys Val Ser Arg Gly Arg Leu Leu Gly Leu Leu His Leu Leu  
35 40 45

Ile Phe Leu Asn Cys Ala Phe Thr Phe Gly Tyr Met Thr Phe Glu His  
50 55 60

Phe Gln Ser Thr Asn Arg Val Ala Leu Thr Met Gly Ala Val Val Ala  
65 70 75 80

Leu Leu Trp Gly Val Tyr Ser Ala Ile Glu Thr Trp Lys Phe Ile Thr  
85 90 95

Ser Arg Cys Arg Leu Cys Leu Leu Gly Arg Lys Tyr Ile Leu Ala Pro  
100 105 110

Ala His His Val Glu Ser Ala Ala Gly Phe His Pro Ile Ala Ala Asn  
115 120 125

Asp Asn His Ala Phe Val Val Arg Arg Pro Gly Ser Thr Thr Val Asn  
130 135 140

Gly Thr Leu Val Pro Gly Leu Lys Ser Leu Val Leu Gly Gly Arg Lys  
145 150 155 160

Ala Val Lys Gln Gly Val Val Asn Leu Val Lys Tyr Ala Lys  
165 170